

1. A method of transferring heat from a body portion of a mammal comprising the acts of:  
determining a state of vasoconstriction or vasodilation in a portion of a body;  
supplying heat to the portion of the body when vasoconstriction is determined; and  
removing heat from the portion of the body when vasodilation is determined.
2. The method of approach 1, wherein the portion of the body is an arterial vascular anastomosis containing portion of the body.
3. The method of approach 1, further including the act of preselecting the portion of the body.
4. The method of approach 1, wherein the act of determining vasoconstriction or vasodilation includes sensing a characteristic of the body associated with the state of vasoconstriction or vasodilation.
5. The method of approach 1, wherein the act of determining vasoconstriction or vasodilation includes measuring blood flow.
6. The method of approach 5, wherein the act of measuring blood flow further includes measuring a volume of the portion of the body.
7. The method of approach 5, wherein the act of measuring blood flow further includes measuring blood flow by laser Doppler.
8. The method of approach 5, wherein a state of vasoconstriction is associated with a first range of blood flow levels and vasodilation is associated with a second range of blood flow levels.
9. The method of approach 1, wherein the act of determining vasoconstriction or vasodilation further includes measuring heat transfer from the portion of the body.

10. The method of approach 1, wherein the act of determining vasoconstriction or vasodilation further includes measuring the temperature of the body.

11. The method of approach 1, wherein the act of determining vasoconstriction or vasodilation further includes measuring the core body temperature.

12. The method of approach 1, wherein the act of determining vasoconstriction or vasodilation further includes measuring tympanic temperature.

13. The method of approach 1, wherein the act of determining vasoconstriction or vasodilation further includes measuring skin temperature of a portion of the body.

14. The method of approach 1, wherein the act of determining vasoconstriction or vasodilation further includes measuring bio-impedance of a portion of the body.

15. The method of approach 1, wherein the act of determining vasoconstriction or vasodilation further includes measuring light absorption of a portion of the body.

16. The method of approach 1, wherein the act of determining vasoconstriction or vasodilation further includes providing an EKG.

17. The method of approach 1, wherein the act of determining vasoconstriction or vasodilation further includes providing an ECG.

18. The method of approach 1, further including the act of controlling at least one of vasoconstriction or vasodilation.

19. The method of approach 18, wherein controlling at least one of vasoconstriction or vasodilation includes the act of inducing vasodilation in a portion of the body.

20. The method of approach 18, wherein controlling at least one of vasoconstriction or vasodilation includes the act of inducing vasoconstriction in a portion of the body.

21. The method of approach 18, wherein the act of controlling at least one of vasoconstriction or vasodilation includes applying a surface treatment to the portion of the body.

22. The method of approach 18, wherein the act of controlling at least one of vasoconstriction or vasodilation includes influencing the thermoregulatory system of the mammal.

23. The method of approach 18, wherein the act of controlling at least one of vasoconstriction or vasodilation includes influencing the Pre-Optic Anterior Hypothalamus (POAH) of the mammal.

24. The method of approach 18, wherein the act of controlling at least one of vasoconstriction or vasodilation includes providing at least one preselected visual stimulus.

25. The method of approach 18, wherein the act of controlling at least one of vasoconstriction or vasodilation includes drug delivery.

26. The method of approach 18, wherein the act of controlling at least one of vasoconstriction or vasodilation includes adjusting the temperature of the portion of the body.

27. The method of approach 1, wherein the act of supplying heat further includes supplying sufficient heat to effect vasodilation.

28. The method of approach 1, further including the act of applying negative pressure to the portion of the body.

29. A method of transferring heat from a body portion of a mammal comprising the acts of:

inducing a transition of a body portion from a state of vasodilation to vasoconstriction by removing heat from the body portion; -

determining a transition temperature associated with the transition from vasodilation to vasoconstriction;

reestablishing vasodilation in the body portion; and

removing heat from the body portion with a temperature equal to or greater than the transition temperature.

30. The method claim 29, wherein if the body portion is initially in vasoconstriction, supplying heat until vasodilation occurs before inducing the transition from vasodilation to vasoconstriction.

31. The method of claim 29, wherein the temperature is within 2°C of the transition from vasodilation to vasoconstriction.

32. The method of claim 29, wherein the temperature is within 1°C of the transition from vasodilation to vasoconstriction.

33. The method of claim 29, wherein the temperature is lowered after reestablishing vasodilation without inducing vasoconstriction.

34. The method of claim 29, further comprising a method of one or more of claims 1-28.

35. A method of transferring heat to or from a portion of a body of a mammal comprising the acts of:

determining a state of vasoconstriction or vasodilation in a portion of the body;

when vasodilation is determined, selecting transferring heat to or from the portion of the body; and

when vasoconstriction is determined, selecting at least one of supplying heat to the portion of the body and not removing heat from the portion of the body,

whereby optimal thermoregulatory status of the mammal is maintained.

36. The method of approach 35, further comprising a method of one or more of claims 1-28.

37. A method for controlling the body temperature of a mammal comprising:  
removing or supplying heat from a portion of the body,  
while maintaining the portion of the body above a temperature causing vasoconstriction in the portion of the body by a means for control employing a measured characteristic associated with a state of vasoconstriction or vasodilation of the portion of the body.

38. The method of approach 37, wherein the temperature of the portion of the body is maintained above 18°C to 22°C.

39. The method of approach 37, further including the act of maintaining the temperature of the portion of the body below approximately 25°C.

40. A method of controlling body temperature of a mammal comprising:  
placing at least a portion of the body in thermal communication with a conductor;  
measuring a characteristic associated with a state of vasoconstriction or vasodilation in the portion of the body; and  
controlling heating or cooling of the conductor to maintain vasodilation in the portion of the body based upon a value that relates the characteristic to vasodilation.

41. The method of approach 40, wherein the value is determined by  
supplying heat until vasodilation occurs,  
removing heat until vasoconstriction occurs,  
reestablishing vasodilation, and  
setting the value equal to or greater than a value corresponding to the transition from vasodilation to vasoconstriction.

42. The method of approach 41, wherein the value is associated with a temperature of the conductor greater than or equal to a temperature where a transition of vasodilation to vasoconstriction occurs.

43. A system for controlling body temperature of a mammal comprising:  
a conductor adapted to interface with a body portion of the mammal;  
a controller adapted to vary a temperature of the conductor;  
a means for sensing a characteristic associated with vasoconstriction or vasodilation of the body portion,

wherein the controller adjusts the temperature of the conductor to maintain vasodilation in the portion of the body portion based upon a predetermined schedule that relates to the characteristic to vasodilation.

44. The system of claim 43, further including a heat exchange medium in thermal communication with at least a portion of the mammal and with at least a portion of the conductor.

45. The system of claim 43, wherein the controller is adapted to perform the methods of one or more of claims 1-42.